AGILENT TECHNOLOGIES, INC.
Legal Department, DL429
Intellectual Property Administration
P. O. Box 7599
Loveland, Colorado 80537-0599

ATTORNEY DOCKET NO. 70020720

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Hin, et al

Serial No.: 10/616,581

Examiner: Mouttet, Blaise

Filing Date: July 9, 2003

Group Art Unit: 2853

Title: Print Mechanism Utilizing An Optical Imaging Sensor

COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria VA 22313-1450

NOTICE OF APPEAL FROM THE EXAMINER TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Sir:

Applicant hereby appeals to the Board of Patent Appeals and Interferences from the decision of the examiner dated, 2/08/2005 , rejecting the following claims 2, 4-6, 8 and 10-12.

The fee for this Notice of Appeal (37 CFR 1.17(b)) is **$500.00**.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

☐	one month	$ 120.00
☐	two months	$ 450.00
☐	three months	$1020.00
☐	four months	$1590.00

☐ The extension fee has already been filled in this application.

☒ (b) Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account **50-1078** the sum of $500.00. At any time during the pendency of this application. please charge any fees required or credit any overpayment to Deposit Account **50-1078** pursuant to 37 CFR 1.25.

A duplicate copy of this transmittal letter is enclosed.

☐ I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date of Deposit: **OR**

☒ I hereby certify that this paper is being facsimile transmitted to the Patent and Trademark Office on the date shown below.

Date of Facsimile: April 4, 2005

Typed Name: Calvin Ward

Signature:

Respectfully submitted,
Hin, et al

By

Calvin B. Ward
Attorney/Agent for Applicant(s)

Reg. No. 30,896

Date: April 4, 2005

Telephone No. 925-855-0413

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Filing Date: July 9, 2003 **Group Art Unit:** 2853

Title: Print Mechanism Utilizing An Optical Imaging Sensor

COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on April 4, 2005 .

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) **$500.00**.

(complete (a) or (b) as applicable)

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Inventor(s): Hin, et al

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Filing Date: July 9, 2003 **Group Art Unit:** 2853

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Attorney/Agent for Applicant(s)

Reg. No. 30,896

Date: April 4, 2005

Telephone No. 925-855-0413

PATENT APPLICATION
Attorney Docket: 70020720-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS

Applicant:	Hin
Serial No.:	10/616,581
Filed:	7/9/2003
For:	Print Mechanism Utilizing an Optical Imaging Sensor
Group Art Unit:	2853
Examiner:	Mouttet, Blaise

BRIEF FOR APPELLANT

Hon. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

Sir:

This is an appeal from the decision of the Primary Examiner dated 2/8/2005, finally rejecting Claims 2, 4-6, 8 and 10-12 in the above-identified patent application.

I. REAL PARTY IN INTEREST

The real party in interest is Agilent Technologies, Inc. having an address as shown below.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to appellant, the appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal.

III. STATUS OF THE CLAIMS

Claims 2, 4-6, 8 and 10-12 are currently pending in the above-identified patent application. In the Office Action dated 2/8/2005, the Examiner rejected Claims 2, 4-6, 8 and 10-12 and indicated that the Action was final. Claims 1, 3, 7, and 9 have been canceled.

IV. STATUS OF AMENDMENTS

There have been no amendments to the claims after the final rejection discussed above.

V. SUMMARY OF THE INVENTION

The present invention can be more easily understood with reference to Figure 1 and the discussion thereof that begins at line 9 on page 2. The present invention includes a print mechanism[10] and a method for printing. The print mechanism[10] includes a print head assembly[16], an actuator[13] for moving the same, and a controller[12]. The print head assembly[16] includes a position detector[14] and a marking device[11]. The position detector[14] includes an imaging device for periodically forming an image of a portion of a print medium[19]. The actuator[13] moves the print head assembly[16] relative to the print medium[19] in a predetermined direction as shown by the arrows 17. The controller[12] compares first and second images formed by the imaging device at first and second times, respectively, while the print head assembly[16] moves relative to the print medium[19] and determines a displacement of the print head assembly[16] between the first and second times from the images. The controller[12] causes the marking device[11] to mark the print medium[19] at locations determined by the determined displacement.

In the embodiments of Claims 2, 8, 11, and 12, the controller varies the speed of the print head relative to the medium to reduce variations in the speed of the print head across the paper as discussed in the paragraph starting at line 1 of page 4.

In the embodiments of Claims 4 and 10, the imaging device generates a one-dimensional image of the print medium in a direction parallel to the direction of motion of the print head as explained starting at line 24 of page 4.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Rejection of Claims 2, 8, 11 and 12 as being unpatentable under 35 U.S.C. 103(a) over Hess, *et al* (hereafter "Hess") US 6,719,467 in view of Hoshino, *et al* (hereafter "Hoshino") US 6,709,085.

B. Rejection of Claims 4-6 and 10 as being unpatentable under 35 U.S.C. 103(a) over Hess US 6,719,467 in view of Tullis US 6,118,132.

VII. ARGUMENT

A. The Examiner's burden under 35 U.S.C. 103

The Examiner has the burden of showing that the combined references teach all of the claim limitations and that there is a motivation to combine the teachings to arrive at the claimed subject matter.

"The mere fact that a reference could be modified to produce the patented invention would not make the modification obvious unless it is suggested by the prior art." (*Libbey-Owens-Ford v. BOC Group*, 4 USPQ 2d 1097, 1103). "When the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the reference" (*In re* Rijckaert, 28 USPQ2d, 1955, 1957).

Under the doctrine of inherency, if an element is not expressly disclosed in a prior art reference, the reference will still be deemed to anticipate a subsequent claim if the missing element "is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." Cont'l Can Co. v. Monsanto Co., 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749(Fed. Cir. 1991). "Inherent anticipation requires that the missing descriptive material is 'necessarily present,' not merely probably or possibly present, in the prior art." Trintec Indus., Inc. v. Top-U.S.A. Corp., 295 F.3d 1292, 1295, 63 USPQ2d 1597, 1599(Fed. Cir. 2002) (Quoting In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)).

Where the claimed subject matter has been rejected as obvious in view of a combination of prior art references, a proper analysis under section 103 requires, *inter alia*,

consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and (2) whether the prior art would also have revealed that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success... Both the suggestion and the reasonable expectation of success must be founded in the prior art, not in the applicant's disclosure. *In re Vaeck*, 20 USPQ2d 1438, 1442(CAFC 1991).

B. Rejection of Claims 2 and 8

Claims 2 and 8 require that the actuator that moves the print head relative to the print medium has an input signal that controls the speed of the actuator and that the input signal is varied in response to the displacement of the print head so as to reduce fluctuations in the speed of the print head relative to the print medium. The Examiner admits that Hess does not teach this limitation.

The Examiner looks to Hoshino as providing the missing teachings. According to the Examiner, Hoshino discloses a self motorized inkjet printer similar to the type described by Hess in which images of the print surface are detected and an input signal to an actuator (9) moves a print head assembly to compensate for the displacement of the print head being outside a predetermined range so as to reduce fluctuations in the speed. The Examiner points to the passages at col. 9, lines 41-60 and col. 11, lines 18-30 as supporting this assertion. According to the Examiner, it would be obvious to vary the input signal to the actuator of Hess to reduce speed fluctuations as taught in Hoshino.

Hess teaches coordinating the location of the print head as determined by various sensing schemes with the print dispensing function to create the desired graphic on the floor. Hoshino teaches a method for maintaining the direction of travel of the print head, not a mechanism for maintaining the speed of that print head over the surface. Hence, the combination of the teachings of the references would be the use of the Hoshino direction tracking algorithm and mechanism to assure that the print head of Hess travels in a straight line while printing.

With reference to the passage at column 9 of Hoshino cited by the Examiner, the system taught in Hoshino tracks an invisible straight line. The cited passage refers to the

correction of the direction of travel when the controller in the device determines that the device has strayed from the straight line by more than the allowed tolerance. In such a case, the appropriate motor is activated to return the print head to the correct direction of travel. Hence, this passage does teach that the correction reduces fluctuations in the speed of the print head.

With reference to the passage at column 11, Hoshino teaches compensating for variations in the speed of the wheels of the apparatus relative to one another to force the apparatus to move in the correct direction. The cited passage does not teach changing the speed of the motors to reduce fluctuations in the speed of the device across the print medium as required by the claims in question.

The Examiner also maintains that speed fluctuation reduction is inherent in the mechanism that maintains the linear scan path. Applicant must again disagree. A linear scan path is maintained if the device is pointed in the correct direction and the wheels are all traveling at the same speed. If for example, all of the wheels were to speed up by the same amount, the device would still travel in the same direction. Similarly, if all of the wheels were to slow down by the same amount, the device would still travel in the same direction. The device of Hoshino would not correct for either of these speed fluctuations, even though the print head would be moving at different speeds with respect to the print medium. Similarly, if the device veers to one direction because one wheel is turning too slowly, the device taught in Hoshino is just as likely to compensate by slowing the other wheel to an even slower speed to cause the device to return to the same path. Hence, it is not inherent in the scheme taught in Hoshino that the algorithm taught therein reduces fluctuations in the speed with which the print head moves over the medium.

Hence, the combination of the two references does not teach all of the limitations of the claims. Accordingly, Applicant submits that the Examiner has not made a *primia facia* case for obviousness with reference to Claims 2 and 8 or the claims dependent therefrom.

C. Rejection of Claims 4-6 and 10

Claims 4-6 and 10 require that the position detector include an image sensor that generates a one-dimensional image of the print medium in a direction parallel to the direction of travel of the print head.

The Examiner admits that Hess does not teach that the imaging device comprises an image sensor for generating a one-dimensional image of the print medium in a direction parallel to the predetermined direction. The Examiner looks to Tullis as providing the missing teaching. The Examiner states that the motivation for combining the teachings is the reduction of the computational complexity.

Applicant submits that the use of a one-dimensional image in the apparatus of Hess leads to an inoperative device, and hence, there is no reasonable expectation of success. The floor printer taught in Hess must move over a two-dimensional surface and correct for deviations from the desired direction of motion; hence, successive images must be capable of determining the two-dimensional displacement that occurred between the images. A one-dimensional image cannot provide that information. Hence, the combination suggested by the Examiner would not function to carry out the computations required by the system of Hess.

The Examiner attempts to overcome this problem by stating that one can use a one-dimensional scanner to generate two-dimensional imaging data, and hence, such a device would not be inoperable. The claim requires the generation of a one-dimensional image, not a one-dimensional scanner. Hence, the Examiner's argument misses the point. Furthermore, the locating sensors shown at 21 and 22 must locate the fiducial marks placed by the fiducial nozzles. These marks are in a line that is parallel to the direction of travel. Hence, a scanner that generated a one-dimensional image parallel to the direction of travel will miss these marks unless the scanner locates the line precisely on the fiducial line it is trying to detect. Furthermore, the scanner would be unable to track deviations of the marks from the desired line once a mis-alignment occurred.

Hence, the Examiner has failed to make a *primia facia* case for obviousness with reference to Claims 4-6 and 10.

VII. CONCLUSION

Appellants respectfully submit that for the reasons of fact and law argued herein, the decision of the Examiner in finally rejecting Claims 2, 4-6, 8, and 10-12 should be reversed.

I hereby certify that this paper (along with any others attached hereto) is being sent via facsimile to fax number: 703-872-9306

Respectfully Submitted,

Calvin B. Ward
Registration No. 30,896
Date: April 4, 2005

Agilent Technologies, Inc.
Legal Department, M/S DL429
Intellectual Property Administration
P.O. Box 7599
Loveland, CO 80537-0599
Telephone (925) 855-0413
Telefax (925)855-9214

APPENDIX

THE CLAIMS ON APPEAL:

2. A print mechanism comprising:

a print head assembly comprising a position detector and a marking device, said position detector comprising an imaging device for periodically forming an image of a portion of a print medium;

an actuator for moving said print head assembly relative to said print medium in a predetermined direction; and

a controller for comparing first and second images formed by said imaging device at first and second times, respectively, in a time interval in which said actuator has moved said print head assembly relative to said print medium and for determining a displacement of said print head assembly between said first and second times, said controller causing said marking device to mark said print medium at locations determined by said determined displacement while said print head assembly is moving relative to said print medium,

wherein said actuator moves said print head assembly relative to said print medium at a speed that depends on an input signal to said actuator and wherein said input signal is varied in response to said determined displacement so as to reduce fluctuations in said speed.

4. A print mechanism comprising:

a print head assembly comprising a position detector and a marking device, said position detector comprising an imaging device for periodically forming an image of a portion of a print medium;

an actuator for moving said print head assembly relative to said print medium in a predetermined direction; and

a controller for comparing first and second images formed by said imaging device at first and second times, respectively, in a time interval in which said actuator has moved said print head assembly relative to said print medium and for determining a displacement of said print head assembly between said first and second times, said controller causing said marking device to mark said print medium at locations determined by said determined displacement while said print head assembly is moving relative to said print medium,

wherein said imaging device comprises an image sensor for generating a one-dimensional image of said print medium in a direction parallel to said predetermined direction.

5. The print mechanism of Claim 4, wherein said imaging device comprises a light source for illuminating said print medium at an angle that is less than 45 degrees with respect to a surface of said print medium.

6. The print mechanism of Claim 4 wherein said marking device comprises an ink-dispensing mechanism for depositing ink droplets on said print medium.

8. A method for printing on a print medium, said method comprising:

causing a print head assembly comprising a position detector and a marking device, to move across said print medium in a predetermined direction, said position detector comprising an imaging device for periodically forming an image of a portion of a print medium;

comparing first and second images formed by said position detector at first and second times, respectively, in a time interval in which said print head assembly has moved relative to said print medium and determining a displacement of said print head assembly between said first and second times; and

causing said marking device to mark said print medium at locations determined by said determined displacement while said print head assembly is moving relative to said print medium,

wherein said print head assembly moves relative to said print medium at a speed that depends on an input signal to an actuator and wherein said input signal is varied in response to said determined displacement so as to reduce fluctuations in said speed.

10. A method for printing on a print medium, said method comprising:

causing a print head assembly comprising a position detector and a marking device, to move across said print medium in a predetermined direction, said position detector comprising an imaging device for periodically forming an image of a portion of a print medium;

comparing first and second images formed by said position detector at first and second times, respectively, in a time interval in which said print head assembly has moved relative to said print medium and determining a displacement of said print head assembly between said first and second times; and

causing said marking device to mark said print medium at locations determined by said determined displacement while said print head assembly is moving relative to said print medium,

wherein said first and second images are one-dimensional images of said print medium generated in a direction parallel to said predetermined direction.

11. The method of Claim 8 wherein said print medium is illuminated by a light source that generates light at an angle that is less than 45 degrees with respect to a surface of said print medium.

12. The method of Claim 8 wherein said marking device deposits ink droplets on said print medium.

PATENT APPLICATION
Attorney Docket: 70020720-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS

Applicant:	Hin
Serial No.:	10/616,581
Filed:	7/9/2003
For:	Print Mechanism Utilizing an Optical Imaging Sensor
Group Art Unit:	2853
Examiner:	Mouttet, Blaise

BRIEF FOR APPELLANT

Hon. Commissioner of Patents
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Where the claimed subject matter has been rejected as obvious in view of a combination of prior art references, a proper analysis under section 103 requires, *inter alia*,

consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and (2) whether the prior art would also have revealed that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success... Both the suggestion and the reasonable expectation of success must be founded in the prior art, not in the applicant's disclosure. *In re Vaeck*, 20 USPQ2d 1438, 1442(CAFC 1991).

B. Rejection of Claims 2 and 8

Claims 2 and 8 require that the actuator that moves the print head relative to the print medium has an input signal that controls the speed of the actuator and that the input signal is varied in response to the displacement of the print head so as to reduce fluctuations in the speed of the print head relative to the print medium. The Examiner admits that Hess does not teach this limitation.

The Examiner looks to Hoshino as providing the missing teachings. According to the Examiner, Hoshino discloses a self motorized inkjet printer similar to the type described by Hess in which images of the print surface are detected and an input signal to an actuator (9) moves a print head assembly to compensate for the displacement of the print head being outside a predetermined range so as to reduce fluctuations in the speed. The Examiner points to the passages at col. 9, lines 41-60 and col. 11, lines 18-30 as supporting this assertion. According to the Examiner, it would be obvious to vary the input signal to the actuator of Hess to reduce speed fluctuations as taught in Hoshino.

Hess teaches coordinating the location of the print head as determined by various sensing schemes with the print dispensing function to create the desired graphic on the floor. Hoshino teaches a method for maintaining the direction of travel of the print head, not a mechanism for maintaining the speed of that print head over the surface. Hence, the combination of the teachings of the references would be the use of the Hoshino direction tracking algorithm and mechanism to assure that the print head of Hess travels in a straight line while printing.

With reference to the passage at column 9 of Hoshino cited by the Examiner, the system taught in Hoshino tracks an invisible straight line. The cited passage refers to the

correction of the direction of travel when the controller in the device determines that the device has strayed from the straight line by more than the allowed tolerance. In such a case, the appropriate motor is activated to return the print head to the correct direction of travel. Hence, this passage does teach that the correction reduces fluctuations in the speed of the print head.

With reference to the passage at column 11, Hoshino teaches compensating for variations in the speed of the wheels of the apparatus relative to one another to force the apparatus to move in the correct direction. The cited passage does not teach changing the speed of the motors to reduce fluctuations in the speed of the device across the print medium as required by the claims in question.

The Examiner also maintains that speed fluctuation reduction is inherent in the mechanism that maintains the linear scan path. Applicant must again disagree. A linear scan path is maintained if the device is pointed in the correct direction and the wheels are all traveling at the same speed. If for example, all of the wheels were to speed up by the same amount, the device would still travel in the same direction. Similarly, if all of the wheels were to slow down by the same amount, the device would still travel in the same direction. The device of Hoshino would not correct for either of these speed fluctuations, even though the print head would be moving at different speeds with respect to the print medium. Similarly, if the device veers to one direction because one wheel is turning too slowly, the device taught in Hoshino is just as likely to compensate by slowing the other wheel to an even slower speed to cause the device to return to the same path. Hence, it is not inherent in the scheme taught in Hoshino that the algorithm taught therein reduces fluctuations in the speed with which the print head moves over the medium.

Hence, the combination of the two references does not teach all of the limitations of the claims. Accordingly, Applicant submits that the Examiner has not made a *primia facia* case for obviousness with reference to Claims 2 and 8 or the claims dependent therefrom.

C. Rejection of Claims 4-6 and 10

Claims 4-6 and 10 require that the position detector include an image sensor that generates a one-dimensional image of the print medium in a direction parallel to the direction of travel of the print head.

The Examiner admits that Hess does not teach that the imaging device comprises an image sensor for generating a one-dimensional image of the print medium in a direction parallel to the predetermined direction. The Examiner looks to Tullis as providing the missing teaching. The Examiner states that the motivation for combining the teachings is the reduction of the computational complexity.

Applicant submits that the use of a one-dimensional image in the apparatus of Hess leads to an inoperative device, and hence, there is no reasonable expectation of success. The floor printer taught in Hess must move over a two-dimensional surface and correct for deviations from the desired direction of motion; hence, successive images must be capable of determining the two-dimensional displacement that occurred between the images. A one-dimensional image cannot provide that information. Hence, the combination suggested by the Examiner would not function to carry out the computations required by the system of Hess.

The Examiner attempts to overcome this problem by stating that one can use a one-dimensional scanner to generate two-dimensional imaging data, and hence, such a device would not be inoperable. The claim requires the generation of a one-dimensional image, not a one-dimensional scanner. Hence, the Examiner's argument misses the point. Furthermore, the locating sensors shown at 21 and 22 must locate the fiducial marks placed by the fiducial nozzles. These marks are in a line that is parallel to the direction of travel. Hence, a scanner that generated a one-dimensional image parallel to the direction of travel will miss these marks unless the scanner locates the line precisely on the fiducial line it is trying to detect. Furthermore, the scanner would be unable to track deviations of the marks from the desired line once a mis-alignment occurred.

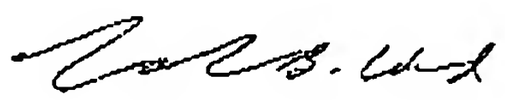
Hence, the Examiner has failed to make a *primia facia* case for obviousness with reference to Claims 4-6 and 10.

VII. CONCLUSION

Appellants respectfully submit that for the reasons of fact and law argued herein, the decision of the Examiner in finally rejecting Claims 2, 4-6, 8, and 10-12 should be reversed.

I hereby certify that this paper (along with any others attached hereto) is being sent via facsimile to fax number: 703-872-9306

Respectfully Submitted,



Calvin B. Ward
Registration No. 30,896
Date: April 4, 2005

Agilent Technologies, Inc.
Legal Department, M/S DL429
Intellectual Property Administration
P.O. Box 7599
Loveland, CO 80537-0599
Telephone (925) 855-0413
Telefax (925)855-9214

APPENDIX

THE CLAIMS ON APPEAL:

2. A print mechanism comprising:

a print head assembly comprising a position detector and a marking device, said position detector comprising an imaging device for periodically forming an image of a portion of a print medium;

an actuator for moving said print head assembly relative to said print medium in a predetermined direction; and

a controller for comparing first and second images formed by said imaging device at first and second times, respectively, in a time interval in which said actuator has moved said print head assembly relative to said print medium and for determining a displacement of said print head assembly between said first and second times, said controller causing said marking device to mark said print medium at locations determined by said determined displacement while said print head assembly is moving relative to said print medium,

wherein said actuator moves said print head assembly relative to said print medium at a speed that depends on an input signal to said actuator and wherein said input signal is varied in response to said determined displacement so as to reduce fluctuations in said speed.

4. A print mechanism comprising:

a print head assembly comprising a position detector and a marking device, said position detector comprising an imaging device for periodically forming an image of a portion of a print medium;

an actuator for moving said print head assembly relative to said print medium in a predetermined direction; and

a controller for comparing first and second images formed by said imaging device at first and second times, respectively, in a time interval in which said actuator has moved said print head assembly relative to said print medium and for determining a displacement of said print head assembly between said first and second times, said controller causing said marking device to mark said print medium at locations determined by said determined displacement while said print head assembly is moving relative to said print medium,

wherein said imaging device comprises an image sensor for generating a one-dimensional image of said print medium in a direction parallel to said predetermined direction.

5. The print mechanism of Claim 4, wherein said imaging device comprises a light source for illuminating said print medium at an angle that is less than 45 degrees with respect to a surface of said print medium.

6. The print mechanism of Claim 4 wherein said marking device comprises an ink-dispensing mechanism for depositing ink droplets on said print medium.

8. A method for printing on a print medium, said method comprising:

causing a print head assembly comprising a position detector and a marking device, to move across said print medium in a predetermined direction, said position detector comprising an imaging device for periodically forming an image of a portion of a print medium;

comparing first and second images formed by said position detector at first and second times, respectively, in a time interval in which said print head assembly has moved relative to said print medium and determining a displacement of said print head assembly between said first and second times; and

causing said marking device to mark said print medium at locations determined by said determined displacement while said print head assembly is moving relative to said print medium,

wherein said print head assembly moves relative to said print medium at a speed that depends on an input signal to an actuator and wherein said input signal is varied in response to said determined displacement so as to reduce fluctuations in said speed.

10. A method for printing on a print medium, said method comprising:

causing a print head assembly comprising a position detector and a marking device, to move across said print medium in a predetermined direction, said position detector comprising an imaging device for periodically forming an image of a portion of a print medium;

comparing first and second images formed by said position detector at first and second times, respectively, in a time interval in which said print head assembly has moved relative to said print medium and determining a displacement of said print head assembly between said first and second times; and

causing said marking device to mark said print medium at locations determined by said determined displacement while said print head assembly is moving relative to said print medium,

wherein said first and second images are one-dimensional images of said print medium generated in a direction parallel to said predetermined direction.

11. The method of Claim 8 wherein said print medium is illuminated by a light source that generates light at an angle that is less than 45 degrees with respect to a surface of said print medium.

12. The method of Claim 8 wherein said marking device deposits ink droplets on said print medium.

PATENT APPLICATION
Attorney Docket: 70020720-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS

Applicant:	Hin
Serial No.:	10/616,581
Filed:	7/9/2003
For:	Print Mechanism Utilizing an Optical Imaging Sensor
Group Art Unit:	2853
Examiner:	Mouttet, Blaise

BRIEF FOR APPELLANT

Hon. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

Sir:

This is an appeal from the decision of the Primary Examiner dated 2/8/2005, finally rejecting Claims 2, 4-6, 8 and 10-12 in the above-identified patent application.

I. REAL PARTY IN INTEREST

The real party in interest is Agilent Technologies, Inc. having an address as shown below.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to appellant, the appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal.

III. STATUS OF THE CLAIMS

Claims 2, 4-6, 8 and 10-12 are currently pending in the above-identified patent application. In the Office Action dated 2/8/2005, the Examiner rejected Claims 2, 4-6, 8 and 10-12 and indicated that the Action was final. Claims 1, 3, 7, and 9 have been canceled.

IV. STATUS OF AMENDMENTS

There have been no amendments to the claims after the final rejection discussed above.

V. SUMMARY OF THE INVENTION

The present invention can be more easily understood with reference to Figure 1 and the discussion thereof that begins at line 9 on page 2. The present invention includes a print mechanism[10] and a method for printing. The print mechanism[10] includes a print head assembly[16], an actuator[13] for moving the same, and a controller[12]. The print head assembly[16] includes a position detector[14] and a marking device[11]. The position detector[14] includes an imaging device for periodically forming an image of a portion of a print medium[19]. The actuator[13] moves the print head assembly[16] relative to the print medium[19] in a predetermined direction as shown by the arrows 17. The controller[12] compares first and second images formed by the imaging device at first and second times, respectively, while the print head assembly[16] moves relative to the print medium[19] and determines a displacement of the print head assembly[16] between the first and second times from the images. The controller[12] causes the marking device[11] to mark the print medium[19] at locations determined by the determined displacement.

In the embodiments of Claims 2, 8, 11, and 12, the controller varies the speed of the print head relative to the medium to reduce variations in the speed of the print head across the paper as discussed in the paragraph starting at line 1 of page 4.

In the embodiments of Claims 4 and 10, the imaging device generates a one-dimensional image of the print medium in a direction parallel to the direction of motion of the print head as explained starting at line 24 of page 4.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Rejection of Claims 2, 8, 11 and 12 as being unpatentable under 35 U.S.C. 103(a) over Hess, *et al* (hereafter "Hess") US 6,719,467 in view of Hoshino, *et al* (hereafter "Hoshino") US 6,709,085.

B. Rejection of Claims 4-6 and 10 as being unpatentable under 35 U.S.C. 103(a) over Hess US 6,719,467 in view of Tullis US 6,118,132.

VII. ARGUMENT

A. The Examiner's burden under 35 U.S.C. 103

The Examiner has the burden of showing that the combined references teach all of the claim limitations and that there is a motivation to combine the teachings to arrive at the claimed subject matter.

"The mere fact that a reference could be modified to produce the patented invention would not make the modification obvious unless it is suggested by the prior art." (*Libbey-Owens-Ford v. BOC Group*, 4 USPQ 2d 1097, 1103). "When the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the reference" (*In re* Rijckaert, 28 USPQ2d, 1955, 1957).

Under the doctrine of inherency, if an element is not expressly disclosed in a prior art reference, the reference will still be deemed to anticipate a subsequent claim if the missing element "is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." Cont'l Can Co. v. Monsanto Co., 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749(Fed. Cir. 1991). "Inherent anticipation requires that the missing descriptive material is 'necessarily present,' not merely probably or possibly present, in the prior art." Trintec Indus., Inc. v. Top-U.S.A. Corp., 295 F.3d 1292, 1295, 63 USPQ2d 1597, 1599(Fed. Cir. 2002) (Quoting In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)).

Where the claimed subject matter has been rejected as obvious in view of a combination of prior art references, a proper analysis under section 103 requires, *inter alia*,

consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and (2) whether the prior art would also have revealed that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success... Both the suggestion and the reasonable expectation of success must be founded in the prior art, not in the applicant's disclosure. *In re Vaeck*, 20 USPQ2d 1438, 1442(CAFC 1991).

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Claims 2 and 8 require that the actuator that moves the print head relative to the print medium has an input signal that controls the speed of the actuator and that the input signal is varied in response to the displacement of the print head so as to reduce fluctuations in the speed of the print head relative to the print medium. The Examiner admits that Hess does not teach this limitation.

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The Examiner also maintains that speed fluctuation reduction is inherent in the mechanism that maintains the linear scan path. Applicant must again disagree. A linear scan path is maintained if the device is pointed in the correct direction and the wheels are all traveling at the same speed. If for example, all of the wheels were to speed up by the same amount, the device would still travel in the same direction. Similarly, if all of the wheels were to slow down by the same amount, the device would still travel in the same direction. The device of Hoshino would not correct for either of these speed fluctuations, even though the print head would be moving at different speeds with respect to the print medium. Similarly, if the device veers to one direction because one wheel is turning too slowly, the device taught in Hoshino is just as likely to compensate by slowing the other wheel to an even slower speed to cause the device to return to the same path. Hence, it is not inherent in the scheme taught in Hoshino that the algorithm taught therein reduces fluctuations in the speed with which the print head moves over the medium.

Hence, the combination of the two references does not teach all of the limitations of the claims. Accordingly, Applicant submits that the Examiner has not made a *primia facia* case for obviousness with reference to Claims 2 and 8 or the claims dependent therefrom.

C. Rejection of Claims 4-6 and 10

Claims 4-6 and 10 require that the position detector include an image sensor that generates a one-dimensional image of the print medium in a direction parallel to the direction of travel of the print head.

The Examiner admits that Hess does not teach that the imaging device comprises an image sensor for generating a one-dimensional image of the print medium in a direction parallel to the predetermined direction. The Examiner looks to Tullis as providing the missing teaching. The Examiner states that the motivation for combining the teachings is the reduction of the computational complexity.

Applicant submits that the use of a one-dimensional image in the apparatus of Hess leads to an inoperative device, and hence, there is no reasonable expectation of success. The floor printer taught in Hess must move over a two-dimensional surface and correct for deviations from the desired direction of motion; hence, successive images must be capable of determining the two-dimensional displacement that occurred between the images. A one-dimensional image cannot provide that information. Hence, the combination suggested by the Examiner would not function to carry out the computations required by the system of Hess.

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Hence, the Examiner has failed to make a *primia facia* case for obviousness with reference to Claims 4-6 and 10.

VII. CONCLUSION

Appellants respectfully submit that for the reasons of fact and law argued herein, the decision of the Examiner in finally rejecting Claims 2, 4-6, 8, and 10-12 should be reversed.

I hereby certify that this paper (along with any others attached hereto) is being sent via facsimile to fax number: 703-872-9306

Respectfully Submitted,

Calvin B. Ward
Registration No. 30,896
Date: April 4, 2005

Agilent Technologies, Inc.
Legal Department, M/S DL429
Intellectual Property Administration
P.O. Box 7599
Loveland, CO 80537-0599
Telephone (925) 855-0413
Telefax (925)855-9214

APPENDIX

THE CLAIMS ON APPEAL:

2. A print mechanism comprising:

a print head assembly comprising a position detector and a marking device, said position detector comprising an imaging device for periodically forming an image of a portion of a print medium;

an actuator for moving said print head assembly relative to said print medium in a predetermined direction; and

a controller for comparing first and second images formed by said imaging device at first and second times, respectively, in a time interval in which said actuator has moved said print head assembly relative to said print medium and for determining a displacement of said print head assembly between said first and second times, said controller causing said marking device to mark said print medium at locations determined by said determined displacement while said print head assembly is moving relative to said print medium,

wherein said actuator moves said print head assembly relative to said print medium at a speed that depends on an input signal to said actuator and wherein said input signal is varied in response to said determined displacement so as to reduce fluctuations in said speed.

4. A print mechanism comprising:

a print head assembly comprising a position detector and a marking device, said position detector comprising an imaging device for periodically forming an image of a portion of a print medium;

an actuator for moving said print head assembly relative to said print medium in a predetermined direction; and

a controller for comparing first and second images formed by said imaging device at first and second times, respectively, in a time interval in which said actuator has moved said print head assembly relative to said print medium and for determining a displacement of said print head assembly between said first and second times, said controller causing said marking device to mark said print medium at locations determined by said determined displacement while said print head assembly is moving relative to said print medium,

wherein said imaging device comprises an image sensor for generating a one-dimensional image of said print medium in a direction parallel to said predetermined direction.

5. The print mechanism of Claim 4, wherein said imaging device comprises a light source for illuminating said print medium at an angle that is less than 45 degrees with respect to a surface of said print medium.

6. The print mechanism of Claim 4 wherein said marking device comprises an ink-dispensing mechanism for depositing ink droplets on said print medium.

8. A method for printing on a print medium, said method comprising:

causing a print head assembly comprising a position detector and a marking device, to move across said print medium in a predetermined direction, said position detector comprising an imaging device for periodically forming an image of a portion of a print medium;

comparing first and second images formed by said position detector at first and second times, respectively, in a time interval in which said print head assembly has moved relative to said print medium and determining a displacement of said print head assembly between said first and second times; and

causing said marking device to mark said print medium at locations determined by said determined displacement while said print head assembly is moving relative to said print medium,

wherein said print head assembly moves relative to said print medium at a speed that depends on an input signal to an actuator and wherein said input signal is varied in response to said determined displacement so as to reduce fluctuations in said speed.

10. A method for printing on a print medium, said method comprising:

causing a print head assembly comprising a position detector and a marking device, to move across said print medium in a predetermined direction, said position detector comprising an imaging device for periodically forming an image of a portion of a print medium;

comparing first and second images formed by said position detector at first and second times, respectively, in a time interval in which said print head assembly has moved relative to said print medium and determining a displacement of said print head assembly between said first and second times; and

causing said marking device to mark said print medium at locations determined by said determined displacement while said print head assembly is moving relative to said print medium,

wherein said first and second images are one-dimensional images of said print medium generated in a direction parallel to said predetermined direction.

11. The method of Claim 8 wherein said print medium is illuminated by a light source that generates light at an angle that is less than 45 degrees with respect to a surface of said print medium.

12. The method of Claim 8 wherein said marking device deposits ink droplets on said print medium.